

“they should appear as continuous, traversing bands in all longitudinal sections, irrespective of their position in relation to the axis of the organelle” (p. 205). However, if they are ridges that project only partway into the interior, then “they should appear as continuous, traversing bands, only in longitudinal sections cutting close to the mitochondrial membrane” (p. 205). In other sections “passing lengthwise through the middle of the organelles, the lamellae should show free ends partially outlining a central channel or cavity” (p. 205). Palade contended that his micrographs revealed the second pattern. Palade also appealed to sequential serial sections to establish the claim that the cristae are really ridges, showing that different ridges disappear as one moves from slice to slice. Palade also presented evidence that the cristae are actually infoldings of the inner mitochondrial membrane and that “the light space between the two mitochondrial membranes is found to have approximately the same width as the central light layer of the cristae, with which it appears to communicate freely” (p. 207). Later this was called the *intermembrane space*.

In a 1956 paper in which he provided frequent citations to Sjöstrand’s work, Palade, after indicating that most of the knowledge of fine structure came from his and Sjöstrand’s groups, drew out the contrasts and ended by taking as conciliatory a stance as possible:

The structural details described are the same, but there are, as expected, certain differences in interpretation and nomenclature. For instance, the Swedish group presents the two membranes at the periphery of the mitochondrion as a single structural unit, as a “double-edged” membrane under the name “outer double membrane.” The cristae are not recognized as infoldings but described as “individual structures with only topographical relations to the outer membrane.” The term “inner double membranes” is used for their designation. The points in disagreement are decreasing in number, however. For instance, the existence of two dense lines at the periphery of mitochondrial profiles, revealed by Sjöstrand’s work, was subsequently confirmed by us, and the cristae (“inner double membranes”), originally described as complete septa by the Swedish group, are now recognized as incomplete partitions, at least in some cases. (1956a, pp. 194–5)

The sketches in Figure 6.3 of medial longitudinal sections through the two men’s models illustrate how each inferred a different internal structure from micrographs that were not sufficiently detailed to resolve the issue to everyone’s satisfaction. Palade’s interpretation (bottom left) yielded two aqueous areas, each of which is in communication with a large surface area on one side or the other of the convoluted inner membrane (whose projections into